



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Miller, et al
Serial No. 10/634,118
Filed: August 4, 2003
Confirmation No.: 5751
For: **LOCKING WINDOW
HAVING A CAM LATCH**

Appeal No. _____
Group Art Unit: 3676

Examiner: Carlos Lugo

Mail Stop: Appeal
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

This Appeal Brief is being submitted in this application in triplicate with respect to the Notice of Appeal filed on February 10, 2007. This firm's check in the amount of \$250 is enclosed as fee for the Appeal Brief for a small entity. The Commissioner is hereby authorized to charge any additional fees that may be required to Deposit Account 501923.

This Brief contains these items under the following headings, and in the order set forth below:

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APPELLANT'S BRIEF

1. Real Party in Interest

The real party in interest in this appeal is Hughes Supply and Manufacturing Company of Thomasville, Inc., the assignee of all rights to the disclosed invention, LOCKING WINDOW HAVING A CAM LATCH.

2. Related Appeals and Interferences

There are no appeals or interferences that will directly affect or be directly affected by, or have a bearing on the Board's decision in this appeal.

3. Status of Claims

Claim 9-32 and 35-54 remain in the case with none of the claims being allowed. Claims 9-32 and 35-54 are the subject of this appeal.

4. Status of Amendments

An amendment after the final Office Action dated August 10, 2006 was submitted on November 15, 2006. The Examiner has indicated that the amended claims are not allowable.

5. Summary of Claimed Subject Matter

5.1 Overview of claimed system and method

The present invention relates to a window latch for a locking window. Generally, the invention is a locking window having a frame including at least one window sash that is selectively movable between a first closed position and a second open position and a window latch adapted to be attached to the window. The window latch is selectively movable between a first open position and a second locked position to secure the window sash in the closed position. The window latch includes a cam latch, a housing including a support wall, a pivot fastener for attaching the cam latch to the housing, and a detent for retaining the cam latch in one of the open and locked positions.

The window latch comprises, in combination with other claimed elements, a housing including a support wall extending across the center of the housing and extending downward to engage the surface of the window sash to provide support for the housing. Such a construction enables use of lightweight, durable materials, as explained in detail in the original application at Page 11, line 9 to Page 13, line 23, and elsewhere.

6. Grounds of Rejection to be Reviewed on Appeal

The following rejections are on appeal:

1. Are claims 9-14, 17-30, 35-40, and 43-54 properly rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. No. 4,801,164 to Mosch in view of US Pat. No. 6,135,510 to Diginosa?
2. Are claims 15, 16, 41 and 42 properly rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. No. 4,801,164 to Mosch in view of US Pat. No. 6,135,510 to Diginosa as applied to claims 14 and 40 above, and further in view of US Pat. No. 6,568,723 to Murphy et al?
3. Are claims 31 and 32 properly rejected under 35 U.S.C. §103(a) as being unpatentable over US Pat. No. 4,801,164 to Mosch in view of US Pat. No. 6,135,510 to Diginosa as applied to claim 29 above, and further in view of US Pat. No. 1,948,542 to Repass?

7. Arguments

7.1 Claims 9-14, 17-30, 35-40, and 43-54 are not obvious

The Examiner has conceded that Mosch fails to disclose supporting walls that engage the surface of the window sash. However, the Examiner looks to Diginosa for a teaching that it would be well known in the art to have supporting walls that extend from one perimeter wall to another perimeter wall and that engage a surface of a window sash so as to impart strength to the housing. It is the burden of the Patent Examiner to establish a prima facie case of obviousness when rejecting claims under 35 USC §103. In re Reuter, 651 F.2d 751, 210 USPQ 249 (CCPA 1981). In this case, the Patent Office has failed in several respects to meet this burden.

The Examiner has also failed to address several claim elements in the Office Action, implicitly conceding that they are not present in the references. In particular, the requirement in Claim 1(e) that "said protrusion and said groove [of the detent] being substantially parallel to the axis of said pivot fastener" is shown not in cited art. In addition, the elements in Claim 1(b) that "said pair of rigid interior support walls extend downward to engage the surface of the window sash;" in Claims 22 and 48 that "said support wall is between said aperture and cam latch;" and in Claims 23 and 49 that "said support wall is substantially perpendicular to said window frame" are not found or suggested in any of the references.

7.1.1 There Must Be a Basis in the Art for Combining or Modifying References

It has been repeatedly held by the Court of Appeals for the Federal Circuit that absent some teaching, suggestion, or incentive supporting a combination of references, obviousness cannot be established by combining the teachings of the prior art. ACS Hospital Systems, Inc. v. Montefiori Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 939 (Fed.Cir. 1984). This has been interpreted to mean that there must be a reasonable intrinsic or extrinsic justification for the

proposed combination of references in order to properly reject the claims of an invention. The examiner must propose some logical reason apparent from the evidence of record that justifies his combination or modification of references. In re Regel, 188 USPQ 132 (CCPA 1975). Therefore, it is important in the instant situation to examine whether or not there exists a reasonable intrinsic or extrinsic justification for the proposed combination of references.

Neither reference appears to consider the need for additional strength and support. Mosch appears to be a conventional steel or cast metal sash lock. Such locks are inherently strong and rigid. Diginosa is a slide lock and, by the nature of this design, very little force is transmitted to the housing. Accordingly, neither of these references appears to consider any need for reinforcing the housing of a sash lock.

Thus, it is submitted that the Examiner failed to justify making any modification to Mosch at all. Certainly, if such a modification were contemplated, one would not look to a side-sash slide lock developed for the purpose of eliminating the need for Mosch's top-sash cam lock (see e.g. '510 at col. 1, lines 44-51). When the prior art itself provides no apparent reason for one of ordinary skill in the art to make a modification or combination of references, an argument properly exists that the claimed subject matter would not have been obvious.

7.1.2 References are Not Properly Combinable or Modifiable if Their Intended Function is Destroyed

Where a combination of references require that a secondary reference be used to modify a primary reference and where the modification destroys the purpose or function of the primary reference, a person of ordinary skill in the art would not normally tend to make modification. Therefore, both the CCPA and the Federal Circuit have consistently held that where an obviousness-type rejection is based upon a combination of references, in which the modification of the primary reference by the secondary reference would destroy the intent, purpose or function

of the invention disclosed in the primary reference, such a proposed modification is improper. In re Gordon, 733 F. 2d 900, 221 USPQ 1125 (Fed.Cir. 1984).

Figures 16 and 17 of the Diginosa '510 reference show that the purpose of the interior walls is to provide a guide surface with detents for positioning the sliding lock. The addition of these guide surfaces to a rotating cam lock would defeat the purpose of the cam mechanism and render the cam unable to mesh with the locking arm catch 20 on the opposing sash, thus destroying the function of the primary reference.

7.1.3 Prior Art Does Not Teach Source of The Problem

Even though the solution to a problem, once known, may have a simple answer, the recognition of the problem itself or of the source of the problem is not necessarily obvious. Eibel Process Co. v. Minnesota and Ontario Paper Co., 261 U.S. 45 (1923). This early Supreme Court decision has established the long-standing rule that the discovery of a source of a problem alone may result in the unpatentable invention despite the fact that solution was relatively simple. In the present case, the problem itself is how to add strength to a housing of sash lock while maintaining a conventional appearance such a design allows the use of plastic and other more flexible materials than previously considered (see e.g. specification at page 1, lines 18-31 and page 2, lines 1-9). The present invention solves this problem in a way that is not shown nor suggested by the prior art.

7.1.4 The detent structure is not suggested by the references

Claim 1(e) requires that the protrusion and groove of the detent are substantially parallel to the axis of the pivot fastener. In Mosch, the detent is perpendicular to the axis of the pivot fastener. Diginosa does not have a pivot fastener, so it does not teach anything about the placement of detents in a cam lock. The present invention describes two different detent

structures: a protrusion 60 that is received in a groove 68 with a barbell shaped end 64 (See Fig. 4B; p. 8, line 19 to p. 9, line 29); and a resilient bushing 92 with projections 94 that engage a groove 98 in the housing (See Fig. 6B and 6C; p. 9, line 30 to p. 10, line 25) is simply not shown or suggested by the Mosch and Diginosa references. Mosch uses a spring washer that is mounted perpendicular to the pivot fastener. Diginosa uses a cantilever that engages with the notches in the side of the housing, but offers no suggestion of how such a system could be used in a rotating cam lock. The detent structure of the present invention is designed to provide an audible snap (p. 8, lines 11-18; p. 10, lines 17-25), which is enhanced by the shape and orientation of the resilient bushing, and not suggested by the cited references.

7.1.5 Claims 22 and 48 are not suggested by Diginosa

The Office Action asserts that "Mosch, as modify [sic] by Diginosa, illustrates that the support wall is between the aperture and cam latch." (p. 4) Not only does Diginosa fail to suggest extending the support wall to the surface of the sash, as described above, it fails to suggest a location for the "support wall." The Examiner indicates in attachment #1 to the Office Action that the "rigid supporting walls" of Diginosa are the hollow fastener receiving column 27 and the undesignated walls that connect them to the perimeter walls of the two rectangular box sections 23. Even if these undesignated walls were placed in the box sections for support (as opposed to the more likely reason of permitting the housing to be produced by injection molding), there is no suggestion to use them to support the housing of a cam latch "between the aperture and cam latch." These undesignated wall in Diginosa is located between the aperture 27 and both the inner and outer walls of the box section 23, thus it provides no suggestion of placing walls between the aperture and a cam latch. Moreover, it does not support the placement of a pair of walls between a pair of apertures and a cam latch.

7.2 Claims 15, 16, 41 and 42 are not obvious

For the reasons set forth above, the Mosch/Diginosa combination that forms the basis for the rejections of claims 15, 16, 41, and 42 fails to meet the statutory requirements under 35 USC §103.

7.3 Claims 31 and 32 are not obvious

For the reasons set forth above, Claim 31 is not obvious. The addition of the Repass reference does not cure the deficiencies of the Mosch/Diginosa combination, especially as discussed in Section 7.1.4. Repass teaches a detent structure including a stud 27 and a notch 28. However, it does not teach or suggest that the stud is received by a groove. Referring to Fig. 5 of Repass, the notch 28 is not a receiving groove, but is simply a notch in the plate of the cam. More importantly, it does not meet the requirement of Claim 29 that the detent "[retain] said cam latch in one of said open and said locked positions." The stud and notch of Repass merely acts as a stop to prevent further movement of the cam latch; it does not retain the latch in the open or close position.

Claim 32 requires that "said semi-circular receiving groove including at least one barbell shaped portion for receiving said protrusion, said protrusion being substantially parallel to the axis of said pivot fastener and said groove being substantially perpendicular to the axis of said pivot fastener." This claim is specifically directed to the embodiment having a protrusion 60 that is received in a groove 68 with a barbell shaped end 64 (See Fig. 4B; p. 8, line 19 to p. 9, line 29). As set forth above, the stud and notch cited by the Examiner do not constitute a groove, and they certainly do not have a barbell shaped portion for receiving a protrusion attached to either the housing or the cam latch. As such, the combination fails to teach or suggest the structure or function of the present invention. None of the cited references would create an audible snap or a tactile feel as a result of the protrusion being captured by the barbell shaped terminus of the groove. This combination is not shown or suggested by the art and is therefore patentable.

7.4 Conclusion

The Applicant respectfully submits the Examiner is incorrect in his belief that claims 9-32 and 35-54 are obvious, and requests that the Board reverse the rejection of the claims.

Respectfully submitted,



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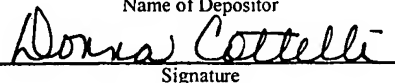
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Donna Cottelli

Name of Depositor



Signature

March 12, 2007

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8. Claims Appendix

The appealed claims are as follows:

9. A window latch for a locking window, said window having a window frame including at least one window sash which is selectively movable between a first closed position and a second open position, said window latch comprising:

- (a) a cam latch selectively movable between a first open position and a second locked position to secure the window sash in said closed position;
- (b) a housing including an opening for said cam latch, a perimeter wall having opposing ends defining said opening on one side of said housing, and a pair of rigid interior support walls, each partially defining said opening and extending across said housing from one opposing end of said perimeter wall to said perimeter wall on an opposite side of the housing wherein said perimeter wall having an opening for said cam latch and said pair of rigid interior support walls extend downward to engage the surface of the window sash to provide support for said housing;
- (c) a pivot fastener for attaching said cam latch to said housing;
- (d) a bushing adapted for use with said pivot fastener; and
- (e) a detent for retaining said cam latch in one of said open and said locked positions, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a receiving groove on the other of said housing and said cam latch, said receiving groove for receiving said protrusion, said protrusion and said groove being substantially parallel to the axis of said pivot fastener.

10. The apparatus according to Claim 9, wherein said cam latch includes an actuator arm, a locking arm and a pivot point location between said actuator arm and said locking arm.

11. The apparatus according to Claim 10, further including a finger tab on said actuator arm.

12. The apparatus according to Claim 10, said locking arm further including a cam wall.

13. The apparatus according to Claim 10, wherein the ratio of the length of said actuator arm to the length of said locking arm is greater than about 2 to provide a mechanical advantage when said window latch is operated.

14. The apparatus according to Claim 10, wherein one of said actuator arm and said locking arm includes a key lock receptor and the other of said actuator arm and said locking arm including a complementary key lock extending into said key lock receptor for attaching said cam latch to said housing.

15. The apparatus according to Claim 14, further including a fastener extending into said key lock and key lock receptor.

16. The apparatus according to Claim 15, said fastener is a self-tapping threaded fastener.
17. The apparatus according to Claim 14, one of said key lock and said key lock receptor further including an alignment feature and the other of said key lock and said key lock receptor further including a mating alignment feature.
18. The apparatus according to Claim 9, wherein said housing extends beyond said pivot fastener parallel to said window frame and includes an aperture for receiving a fastener for attaching said housing to said window.
19. The apparatus according to Claim 18, wherein said aperture for receiving a fastener for attaching said housing to said window includes a retainer for receiving a fastener.
20. The apparatus according to Claim 18, wherein the base of said aperture for receiving a fastener includes a cavity for receiving shavings formed by attaching said window latch to said window.
21. The apparatus according to Claim 9, wherein said housing extends beyond said pivot fastener parallel to said window frame to include a finger shoulder for providing access to said cam latch.
22. The apparatus according to Claim 21, wherein said support wall is between said aperture and cam latch.
23. The apparatus according to Claim 22, wherein said support wall is substantially perpendicular to said window frame.
24. The apparatus according to Claim 9, further including a locking arm catch.
25. The apparatus according to Claim 24, further including a cam detent for engaging said locking arm.
26. The apparatus according to Claim 24, further including an aperture for receiving a fastener for attaching said locking arm catch to said window.
27. The apparatus according to Claim 26, wherein said aperture for receiving a fastener for attaching said locking arm catch to said window includes a retainer for receiving a fastener.
28. The apparatus according to Claim 9, wherein said pivot fastener is substantially non-compressible so as to facilitate the selective movement of said cam latch between said first open position and said second locked position.
29. A locking window, said window comprising:
 - (a) a window frame including at least one window sash which is selectively movable between a first closed position and a second open position; and

- (b) a window latch adapted to be attached to said window and that is selectively movable between a first open position and a second locked position to secure said window sash in said closed position, said window latch comprising:
- (i) a cam latch selectively movable between a first open position and a second locked position to secure the window sash in said closed position;
 - (ii) a housing including an opening for said cam latch, a perimeter wall having opposing ends defining said opening on one side of said housing, and a pair of interior rigid support walls, each partially defining said opening and extending across said housing from one opposing end of said perimeter wall to said perimeter wall on an opposite side of the housing wherein said perimeter wall having an opening for said cam latch and said pair of rigid interior support walls extend downward to engage the surface of the window sash to provide support for the housing;
 - (iii) a pivot fastener for attaching said cam latch to said housing;
 - (iv) a bushing between said cam latch and said housing; and
 - (v) a detent for retaining said cam latch in one of said open and said locked positions, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a receiving groove on the other of said housing and said cam latch, said receiving groove for receiving said protrusion, said protrusion and said groove being substantially parallel to the axis of said pivot fastener.

30. The apparatus according to Claim 29, wherein said detent provides an audible indication of said cam latch being in one of said open and said locked positions.

31. The apparatus according to Claim 29, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a receiving groove on the other of said housing and said cam latch, said protrusion and said groove being substantially parallel to the axis of said pivot fastener.

32. The apparatus according to Claim 29, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a semi-circular receiving groove on the other of said housing and said cam latch, said semi-circular receiving groove including at least one barbell shaped portion for receiving said protrusion, said protrusion being substantially parallel to the axis of said pivot fastener and said groove being substantially perpendicular to the axis of said pivot fastener.

35. The apparatus according to Claim 29, wherein said detent includes at least one resilient portion on one of said housing and said bushing, said resilient portion for

accommodating said protrusion when said cam latch is moved from one of said open and said locked positions to the other of said open and said locked positions.

36. The apparatus according to Claim 29, wherein said cam latch includes an actuator arm, a locking arm and a pivot point location between said actuator arm and said locking arm.

37. The apparatus according to Claim 36, further including a finger tab on said actuator arm.

38. The apparatus according to Claim 36, said locking arm further including a cam wall.

39. The apparatus according to Claim 36, wherein the ratio of the length of said actuator arm to the length of said locking arm is greater than about 2 to provide a mechanical advantage when said window latch is operated.

40. The apparatus according to Claim 36, wherein one of said actuator arm and said locking arm includes a key lock receptor and the other of said actuator arm and said locking arm includes a complementary key lock extending into said key lock receptor for attaching said cam latch to said housing.

41. The apparatus according to Claim 40, further including a fastener extending into said key lock and key lock receptor.

42. The apparatus according to Claim 41, said fastener is a self-tapping threaded fastener.

43. The apparatus according to Claim 40, one of said key lock and said key lock receptor further including an alignment feature and the other of said key lock and said key lock receptor further including a mating alignment feature.

44. The apparatus according to Claim 29, wherein said housing extends beyond said pivot fastener parallel to said window frame and includes an aperture for receiving a fastener for attaching said housing to said window.

45. The apparatus according to Claim 44, wherein said aperture for receiving a fastener for attaching said housing to said window includes a retainer for receiving a fastener.

46. The apparatus according to Claim 44, wherein the base of said aperture for receiving a fastener includes a cavity for receiving shavings formed by attaching said window latch to said window.

47. The apparatus according to Claim 29, wherein said housing extends beyond said pivot fastener parallel to said window frame to include a finger shoulder for providing access to said cam latch.

48. The apparatus according to Claim 47, wherein said support wall is between said aperture and cam latch.

49. The apparatus according to Claim 48, wherein said support wall is substantially perpendicular to said window frame.

50. The apparatus according to Claim 29, further including a locking arm catch.

51. The apparatus according to Claim 50, further including a cam detent for engaging said locking arm.

52. The apparatus according to Claim 50, further including an aperture for receiving a fastener for attaching said locking arm catch to said window.

53. The apparatus according to Claim 52, wherein said aperture for receiving a fastener for attaching said locking arm catch to said window includes a retainer for receiving a fastener.

54. The apparatus according to Claim 29, wherein said pivot fastener is substantially non-compressible so as to facilitate the selective movement of said cam latch between said first open position and said second locked position.

9. Evidence Appendix

Original application as filed.

US Pat. No. 4,801,164 to Mosch

US Pat. No. 6,135,510 to Diginosa

US Pat. No. 6,568,723 to Murphy et al

US Pat. No. 1,948,542 to Repass



A LOCKING WINDOW HAVING A CAM LATCH

Background of the Invention

(1) Field of the Invention

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The present invention relates generally to a locking window and, more particularly, to a window latch for such a window.

(2) Description of the Prior Art

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Up to the end of World War II, most windows were constructed of wood. However, following the War, aluminum windows were initially constructed for low-end housing. Over time, the clear superiority of metal windows led to their use in many different types of housing. Similarly, vinyl windows were introduced in low-end housing in the beginning of the last decade. The use of vinyl windows has grown much more quickly than metal windows. In fact, the majority of windows are now constructed of vinyl.

During this time, locking windows have generally used metal latches similar to those that were initially used on wooden windows. Now, although vinyl windows are the predominant construction, there has still been a hesitancy to use plastic hardware. However, metal is much heavier than its corresponding plastic counterpart. Also, plastic retains its appearance when mishandled or otherwise misused that would cause unacceptable chips to form on painted metal hardware. Also, in today's modern economy, window hardware may be made in another country. Accordingly, advantages of substantial weight savings and lower shipping costs have become even more important.

However, making a locking window having a plastic latch is more than a mere substitution of materials. Because plastic is generally more flexible than metal, attempts at constructing a window latch having a center mounted sweep latch have failed since there's not a sufficient amount of support across the center of the sweep to prevent bowing. The importance of bowing is primarily due to the requirement by

most manufacturers that the cam latch be able to maintain a static load of about 160 pounds. When a conventional center mounted window latch is formed from plastic materials, the bowing of the cam latch is so substantial that the static load will actually slide off the locking arm. Because of this problem, such window latches
5 have not been able to pass the static load test.

Thus, there remains a need for a new and improved locking window having a window latch which may be completely formed from chip resistant plastics while, at the same time, still provides sufficient strength due to its housing arrangement to resist normal wear and tear during assembly and use.

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Summary of the Invention

The present invention is directed to a locking window having a window frame including at least one window sash that is selectively movable between a first closed position and a second open position and a window latch adapted to be attached to the
15 window. The window latch is selectively movable between a first open position and a second locked position to secure the window sash in the closed position. The window latch includes a cam latch, a housing including a support wall, a pivot fastener for attaching the cam latch to the housing, and a detent for retaining the cam latch in one of the open and the locked positions.

20 In a preferred embodiment, the detent provides an audible indication of the cam latch being in one of the open and the locked positions. This may be accomplished by one of several configurations. For example, the detent may include at least one protrusion on one of the housing and the cam latch and a receiving groove on the other of the housing and the cam latch. Preferably, the protrusion and the
25 groove are substantially parallel to the axis of the pivot fastener.

Alternatively, the detent may include at least one protrusion on one of the housing and the cam latch and a semi-circular receiving groove on the other of the housing and the cam latch. Preferably, the semi-circular receiving groove includes at least one barbell shaped portion for receiving the protrusion. More preferably, the
30 protrusion is substantially parallel to the axis of the pivot fastener and the groove is substantially perpendicular to the axis of the pivot fastener.

In a preferred alternative, the detent may further include a bushing adapted for use with the pivot fastener. In such an arrangement, the detent includes at least one protrusion on one of the housing and the bushing and a receiving groove on the other of the housing and the bushing. The receiving is grooved for receiving the protrusion.

5 Preferably, the protrusion and the groove are substantially parallel to the axis of the pivot fastener. In an even more preferred aspect of the present embodiment, the detent may include at least one resilient portion on one of the housing and the bushing. The resilient portion accommodates the protrusion when the cam latch is moved from one of the open and the locked positions to the other of the open and the
10 locked positions.

Those skilled in the art will appreciate that any of the above-described detent configurations may be used separately or in various combinations with each other and other detent configurations to accomplish the creation of the audible indication of the cam latch being in one of the open and the locked positions.

15 The cam latch may include an actuator arm, a locking arm and a pivot point location between the actuator arm and the locking arm. A finger tab may be included on the actuator arm. Further, the locking arm may include a cam wall. To provide a mechanical advantage when the window latch is operated, a ratio of a length of the actuator arm to a length of the locking arm is greater than about 2.

20 One of the actuator arm and the locking arm may include a key lock receptor and the other of the actuator arms and the locking arms then includes a complementary key lock extending into the key lock receptor for attaching the cam latch to the housing. A fastener may extend into the key lock and key lock receptor. Preferably, such fastener is a self-tapping threaded fastener. Further, one of the key
25 lock and the key lock receptor may include an alignment feature 82 and then the other of the key lock and the key lock receptor includes a mating alignment feature.

The housing may extend beyond the pivot fastener parallel to the window frame and include an aperture for receiving a fastener for attaching the housing to the window. The aperture may include a retainer for receiving a fastener. The base of the
30 aperture for receiving a fastener may include a cavity for receiving shavings formed

by attaching the window latch to the window. The support wall may be between the aperture and cam latch, preferably, being substantially perpendicular to the window frame. The housing may extend beyond the pivot fastener parallel to the window frame to include a finger shoulder for providing access to the cam latch.

5 Also, the window latch may include a locking arm catch. Preferably, the locking arm includes a cam detent for engaging the locking arm. Further, the locking arm catch may include an aperture for receiving a fastener for attaching the locking arm catch to the window. Preferably, the aperture of the locking arm catch may include a retainer for receiving a fastener.

10 In a preferred embodiment, the pivot fastener is substantially non-compressible so as to facilitate the selective movement of the cam latch between the first open position and the second locked position.

Accordingly, one aspect of the present invention is to provide a locking window having a window frame including at least one window sash that is selectively
15 movable between a first closed position and a second open position. A window latch is adapted to be attached to the window. The window latch is selectively movable between a first open position and a second locked position to secure the window sash in the closed position. The window latch includes a cam latch, a housing and a pivot fastener for attaching the cam latch to the housing.

20 Another aspect of the present invention is to provide a window latch for a locking window having a window frame including at least one window sash that is selectively movable between a first closed position and a second open position. The window latch includes a cam latch, a housing including a support wall, and a pivot
25 fastener for attaching the cam latch to the housing. The cam latch is selectively movable between a first open position and a second locked position to secure the window sash in the closed position.

Still another aspect of the present invention is to provide a locking window having a window frame including at least one window sash that is selectively movable
30 between a first closed position and a second open position and a window latch adapted to be attached to the window. The window latch is selectively movable

between a first open position and a second locked position to secure the window sash in the closed position. The window latch includes a cam latch, a housing including a support wall, a pivot fastener for attaching the cam latch to the housing, and a detent for retaining the cam latch in one of the open and the locked positions.

5 These and other aspects of the present invention will become apparent to those skilled in the art after a reading of the following description of the preferred embodiment when considered with the drawings.

Brief Description of the Drawings

10 FIGURE 1 is a perspective view of a locking window constructed according to the present intention;

 FIGURE 2A is an isometric top exploded view of the window latch of the locking window shown in its closed position;

15 FIGURE 2B is an isometric view of the assembled cam latch of the window latch of FIGURE 2A;

 FIGURE 3A is an isometric bottom view of the window latch of the locking window shown in its closed position;

 FIGURE 3B is an isometric bottom exploded view of the housing and the cam latch of the window latch of the locking window shown in its closed position;

20 FIGURE 4A is a top view through section of the window latch of FIGURE 1, 2A, and 3A, shown in its closed position;

 FIGURE 4B is a magnified detail of a portion of the top view through section of FIGURE 4A;

25 FIGURE 5A is a top view through the same section as FIGURE 4 of the window latch shown in its opened position;

 FIGURE 5B is a magnified detail of a portion of the top view through section of FIGURE 5A

30 FIGURE 6A is an exploded isometric top view of a window latch including a bushing;

 FIGURE 6B is an exploded isometric bottom view of the window latch of FIGURE 6A; and

FIGURE 6C is a magnified detail of the bushing of FIGURES 6A and 6B.

Description of the Preferred Embodiments

In the following description, like reference characters designate like or
5 corresponding parts throughout the several views. Also in the following description,
it is to be understood that such terms as "forward," "rearward," "front," "back,"
"right," "left," "upwardly," "downwardly," and the like are words of convenience and
are not to be construed as limiting terms.

Referring now to the drawings in general and Figure 1 in particular, it will be
10 understood that the illustrations are for the purpose of describing a preferred
embodiment of the invention and are not intended to limit the invention thereto. A
perspective partial view of the locking window 10 is shown in Figure 1. The window
latch 12 includes a housing 22 fastened to one sash of the frame 14 and a locking arm
catch 20 having a cam detent 21 fastened to another corresponding sash of the frame
15 14 and opposite to the housing 22. As seen in Figures 2A and 2B, a cam latch 16
includes an actuator arm 26 and locking arm 30 pivotally mounted through an
aperture in the housing 22.

The window 10 is locked by pivotally moving the actuator arm 26 inward
toward the housing 22, causing the locking arm 30 to pivotally move away from the
20 housing 22 and engage the cam detent 21 of the locking arm catch 20. The locking
arm 30 disengages the cam detent 21 of the locking arm catch 20 and unlocks the
window 10 when the actuator arm 26 pivotally moves away from the housing.

As best seen in Figures 2A, 3A, 4A and 4B, in the locked position, the locking
arm 30 protrudes beyond the face of the housing 22. By extending into the locking
25 arm catch 20 on the corresponding sash of the frame of the window 10, a cam wall 36
of the locking arm 30 engages the cam detent 21. At the same time, the actuator arm
26 is to one side of the housing 22 of the window latch 12 so as to be substantially
aligned with the face of the housing 22. At the advance end of the cam wall 36, the
locking arm 30 may include an incline 38, seen in Figures 2A, 2B, 4A, 4B, 5A, 5B
30 and 6A, to better facilitate insertion of the locking arm 30 into the locking arm catch
20 to engage cam detent 21.

As best seen Figures 5A and 5B, in the open position, the locking arm 30 is
withdrawn from the locking arm catch 20 and concealed within the housing 22 of the

window latch 12. At the same time, the actuator arm 26 of the cam latch 16 is at another side of the housing 22 of the window latch 12 so as to be substantially aligned with the face of the housing 22 at the other side of the window latch 12.

As previously mentioned, the cam latch 16 includes an actuator arm 26 and a locking arm 30. The cam latch 16 pivots about a pivot point 32. The housing 22 has an aperture at the pivot point 32 to accommodate a pivot fastener 28, 28'. The length of the actuator arm 26 is approximately twice the length of the locking arm 30, thereby providing a mechanical advantage in opening and locking the window 10.

As seen in Figures 3A, 3B, 4A, 5A, 6A and 6B, the housing 22 is strengthened by support walls 46, 50 located between an aperture 40 or 70 for attachment and the pivot point location 32.

The pivot fastener 28, 28' is shown in Figures 2A and 6A in a top exploded view; in Figures 4 and 5 in through sectional views; and in Figure 6B in a bottom exploded view of the window latch 12. The pivot fastener 28, 28' allows the cam latch 16 to pivot freely about the pivot point 32 while the window latch 12 is affixed to the window frame 14. The pivot fastener 28, 28' includes a male key lock portion 28 and a female key lock portion 28', both having a central aperture that allows a fastener 48 to pass therethrough. In the preferred embodiment, the fastener 48 may be any threaded fastener, such as a screw. The female key lock portion 28' is part of the locking arm 30 of the cam latch 16. It will be understood by those skilled in the art that the female key portion 28' may instead be part of the actuator arm 26 and the male portion 28 may be part of the locking arm 30. Further, each of the male key lock portion 28 and the female key portion 28' may include a complementary alignment feature 82 that facilitates the rapid assembly of pivot fastener 28, 28' so that actuator arm 26 and locking arm 30 align properly with the face of housing 22.

A housing 22 having at least a single aperture 40 partially encloses both the locking arm 30 of the cam latch 16 and pivot fastener 28, 28', protecting them from debris that may be generated during construction or installation of the window frame 14 or window 10. The aperture 40 serves as a first attachment point and, in the preferred embodiment, the housing 22 includes a second aperture 70 which serves as a second attachment point for the window latch 12.

Apertures 40 and 70 may each further include an internal retainer 44. An internal retainer 44 may be a small piece of plastic molded into the aperture 40 or aperture 70 that allows a fastener 72 to be temporarily secured in apertures 40 and 70 for packaging or shipping purposes and to prevent loss. Expediting the rapid assembly of window frames in a manufacturing environment is a further advantage of an internal retainer 44.

Each aperture 40 and 70 further may include a cavity 62 in its bottom surface to accommodate shavings generated when the window latch 12 is affixed to the window frame 14. Cavity 62 also may accommodate any pull-up of the window frame 14 during attachment of the window latch 12 to the window frame 14.

The window latch 12 may include structural features such as a detent 56 that limits the range of movement of the cam latch 16 relative to the housing 22. The limited of movement of the cam latch 16 may be accomplished through the cooperation of structural features of the housing 22 and the cam latch 16. Likewise these structural features may cooperate in manner that provide a user of the window latch 12 a feel or sound or both that allow the user to know whether the cam latch 16 is fully engaged or fully disengaged position. In this manner, a user may see, feel and hear that the window latch 12 fully engaged or fully disengaged position.

As may be best seen in Figures 3B, 4A, 4B 5A, 5B and 6B, the detent 56 may be a protrusion 60 extending from the housing 22 that cooperates with a groove 68 defined by the cam wall 36 and collar 58 of the locking arm 30. Figures 4A, 4B 5A, and 5B are through sections of the window latch 12 just below the bottom of the upper most inner surface and above the top of the lower most outer surface of housing 22. As seen in Figures 3B, 4A, 4B 5A, 5B and 6B the housing may include a pair of protrusions 60. As seen in Figures 4A, 4B 5A, and 5B the locking arm 30 may include a pair of grooves 68. The longer of the grooves 68 has a slightly enlarged diameter 64 at blind end. The presence of the enlarged diameter 64, which may resemble a barbell shaped region, reduces a diameter of the collar 58 creating a recess for seating one protrusion 60 when the locking arm 30 is moved to the position for engaging the cam detent 21 as shown in Figures 4A and 4B. In this manner, a user window latch experiences the sensations of the one protrusion 60 seating in the recess at the blind end created by the enlarged diameter 64. In addition to seeing, the

sensation may include the feel and audible snap of the cam latch 16 fully engaging. The shorter of the grooves 68 cooperates with the other of the protrusions 60 when the locking arm 30 is moved to the position for fully disengaging the window latch 21 as shown in Figures 5A and 5B.

5 Each protrusion 60 cooperates with a corresponding groove 68 and the collar 58. The protrusions 60 are located proximate to the pivot point 32 of the cam latch 16. In addition to the recess at the barbell shaped region 64 of the longer groove 68, the collar 58 includes regions having different diameters. As seen in Figures 4B and 5B, a smaller diameter region extends from the end of the shorter groove 68 to the
10 start of the longer groove 68. Also as seen in Figures 4B and 5B, a larger diameter region extends from the transition from the smaller diameter region to the larger diameter region to the end of the longer groove 68. The transition from the smaller diameter region to the larger diameter region is opposite the barbell shaped region 64 of the longer groove 68. In addition, the collar 58 includes a groove 80 that is opposite
15 to the end of the shorter groove 68. The pair of protrusions 60 mate with the grooves 68 and collar 58 of the locking arm 30.

 In operation, as the cam latch 16 moves along its range of motion, protrusions 60 travel along the different diameter regions of collar 58, a portion of which may be within grooves 68. As seen in Figures 4A and 4B, when moving cam latch 16 to the
20 fully engaged position, one protrusion 60 reaches the barbell shaped regions 64 while the other reaches groove 80. At this point, the one protrusion 60 enters a barbell shaped region 64 of groove 68, producing an audible snap. As seen in Figures 5A and 5B, when moving cam latch 16 to the fully disengaged position, one protrusion 60 reaches transition from the larger diameter region to the smaller diameter region of
25 collar 58 while the other reaches the end of the shorter groove 68. At this point, the one protrusion 60 drops from the larger diameter region to the smaller diameter region of collar 58, producing an audible snap. The audible snap assists the user in determining whether the window latch 12 is in a fully engaged or fully disengaged position.

30 In addition to or in place of the structures discussed above, the window latch 12 further may include structural features such as a bushing 92 as a detent 56 that limits the range of movement of the cam latch 16 relative to the housing 22.

As may be best seen in Figures 6A, 6B and 6C, the detent 56 may be a protrusion 94 extending from the bushing 92 that cooperates with a groove 98 in a recess 96 defined by the bottom surface of housing 22. The bushing 92 may include a resilient portion 90 that in the present example is created by using a gap 88 adjacent to protrusion 94. The resilient portion 90 acts to compress the bushing 92 to permit the movement of cam latch 16. The bushing 92 may include a pair of protrusions 94 and corresponding gaps 88. As seen in Figures 6A, and 6B the bushing 92 may fit on pivot fastener 28, 28' between the actuator arm 26 and the locking arm 30 and below housing 22 in recesses 96. Each protrusion 94 cooperates with a corresponding groove 98 and the housing 22. Bushing 92 is seated within recess 96 and protrusions 94 are initially aligned with corresponding grooves 98. The protrusions 94 may be located on the outer diameter of the bushing 92. It will be appreciated by those skilled in the art that the protrusion 94 and resilient region 90 may be included as part of the housing 22 and the groove 98 may be in the bushing 92. Any other structural combinations that accomplish at least one of the see, feel, hear and combination thereof functions are part of the present invention.

In operation, as the cam latch 16 moves along its range of motion, protrusions 94 travel from grooves 98 and the wall of recess 96 compresses the resilient region 90 of bushing 92. When moving cam latch 16 to the fully engaged position, the protrusions 94 reach their corresponding grooves 98. At this point, the resilient region 90 replaces the protrusions 94 to their original extended position so that while the protrusions 94 enter their corresponding grooves 68 an audible snap is produced. When moving cam latch 16 to the fully disengaged position, similar events occur. The audible snap assists the user in determining whether the window latch 12 is in a fully engaged or fully disengaged position.

As seen in Figures 4A, 4B, 5A and 5B, the locking arm catch 20 includes a cam detent 21 that the locking arm 30 engages. The locking arm catch 20 has at least one aperture 74. The aperture 74 serves as a first attachment point and, the locking arm catch 20 may include a second aperture 76 that serves as a second attachment point for the window latch 12.

Apertures 74 and 76 may each further include an internal retainer 44. A small piece of plastic molded into the aperture 74 or aperture 76 may act as an internal

retainer 44 that allows a fastener 72 to be temporarily secured in apertures 74 and 76 for packaging or shipping purposes, and to prevent loss. Expediting the rapid assembly of window frames in a manufacturing environment is a further advantage of an internal retainer 44.

5 Each aperture 74 and 76 further may include a cavity 62 in its bottom surface to accommodate shavings generated when the locking arm catch 20 is affixed to the window frame 14. Cavity 62 also may accommodate any pull-up of the window frame 14 during attachment of the window latch 12 to the window frame 14.

 The window latch 12 may be formed from any lightweight durable material,
10 such as a lightweight metal including aluminum, or a polymeric material. Applicants contemplate that suitable materials may be characterized by at least one of high strength, high rigidity, very good impact resistance, good elastic properties, dimensional stability, low tendency to creep, and simple processing. Preferably, suitable materials may be characterized by a plurality of the above. Applicants have
15 found that among polymeric materials, polyamides (also known as nylons) to work well and, in particular, that polyamides including a filler may work well. In the preferred embodiment, the material used to form the window latch 12 was made using commercially available polyamides such as the "ULTRAMID®" polyamide sold by BASF Corporation of Mount Olive, New Jersey. These ULTRAMID® polyamide
20 materials, their applications, properties and processing as described in a publication by BASF Plastics entitled "ULTRAMID®" Polyamides, the subject matter of which is incorporated in its entirety herein by reference.

 Applicants contemplate that a semi-crystalline Nylon 6 (PA6) containing about 30 percent glass fiber may be preferred. One such material is manufactured by
25 Hughes Supply & Manufacturing Company of Thomasville, Inc. of Thomasville, North Carolina under the trademark "FIBERTRON™" material and has the properties presented below in Table 1.

Table 12 FIBERTRON™ MATERIAL			
Description:	Semi-crystalline Nylon 6 (PA6)		
Filler System:	33 % Glass Fiber		
Characteristics:	Near Prime		
PROPERTY	UNITS	TYPICAL VALUES	STANDARD
General			
Density	g/cm3	1.42	ASTM D792
Melt Flow Index	g/10 min.	-	ASTM D1238
Water Absorption	%	-	ASTM D570
Mold Shrinkage	in/in	0.002-0.004	ASTM D955
Mechanical			
Tensile Strength (break)	psi	19,500	ASTM D638
Elongation (break)	%	3.2	ASTM D638
Flexural Strength (yield)	psi	29,750	ASTM D790
Flexural Modulus	psi	1,250,000	ASTM D790
Impact Strength (Izod-notched)	ft-lb/in	3.3	ASTM D256
Thermal			
Heat Deflection Temperature (264psi)	F	-	ASTM D648
Vicat Softening Temperature	F	-	ASTM D1525
Flammability			
UL Flammability Rating	Class	-	UL 94

5 The "FIBERTRON™" material may be made using commercially available polyamides such as the "ULTRAMID®" polyamide sold by BASF Corporation of Mount Olive, New Jersey. These ULTRAMID® polyamide materials, their applications, properties and processing as described in a publication by BASF Plastics entitled "ULTRAMID® Polyamides, the subject mater of which is incorporated in its entirety herein by reference.

10 Applicants contemplate that alternative materials may appropriate for bushing 92. As with the remainder of the window latch 12, suitable materials for bushing 92 may be characterized by at least one of high strength, high rigidity, very good impact resistance, good elastic properties, dimensional stability, low tendency to creep, and

simple processing. Further, suitable materials for bushing 92 may be characterized by at least one of compatible with the materials used for the remainder of window latch 12, wear resistance, non-abrasive, and a capability of providing the elastic properties for resilient region 90. To that end, bushing 92 may be formed from any lightweight durable material, such as a lightweight metal including aluminum, or a polymeric material. Applicants have found that among polymeric materials, polyoxymethylene (also known as POM, polymethyleneoxide, PMO, polyformaldehyde, polyacetal, acetals, acetal resin, and simple acetal) to work well. Polyoxymethylene including a filler may work well. In the preferred embodiment, the material used to form the bushing 92 are made using commercially available polyoxymethylenes such as the "DELRIN®" acetal resin sold by E.I. du Pont de Nemours and Company of Wilmington, Delaware. These "DELRIN®" acetal resin materials, their applications, properties and processing as described in a publications by E.I. du Pont de Nemours and Company entitled "DELRIN®" acetal resin: Low wear low friction; "DELRIN®" acetal resin: Design Guide-Module III; "DELRIN®" acetal resin: Molding Guide; and "DuPont®" DuPont Engineering Polymers: Products and Properties Guide-"DELRIN®" acetal resin, "DELRIN®" P performance acetal resin, "DELRIN®" "ELEVEN Series" acetal resin, the subject mater of each is incorporated herein by reference in its entirety.

As may be appreciated by those skilled in the art, a window and window latch 12 constructed according to the present invention may be substantially completely formed from plastics while at the same time still provide sufficient strength due to their arrangement to resist normal wear and tear during assembly and use.

Certain modifications and improvements will occur to those skilled in the art upon a reading of the foregoing description. It should be understood that all such modifications and improvements have been deleted herein for the sake of conciseness and readability but are properly within the scope of the following claims.

We Claim:

1. A locking window, said window comprising:

- 5 (a) a window frame including at least one window sash which is selectively movable between a first closed position and a second open position; and
- (b) a window latch adapted to be attached to said window and that is selectively movable between a first open position and a second locked position to secure said window sash in said closed position, said window latch including a cam latch, a
- 10 housing and a pivot fastener for attaching said cam latch to said housing.

2. The apparatus according to Claim 1, further including a detent for retaining said cam latch in one of said open and said locked positions.

15 3. The apparatus according to Claim 2, wherein said detent provides an audible indication of said cam latch being in one of said open and said locked positions.

20 4. The apparatus according to Claim 2, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a receiving groove on the other of said housing and said cam latch, said protrusion and said groove being substantially parallel to the axis of said pivot fastener.

25 5. The apparatus according to Claim 2, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a semi-circular receiving groove on the other of said housing and said cam latch, said semi-circular receiving groove including at least one barbell shaped portion for receiving said protrusion, said protrusion being substantially parallel to the axis of said pivot

30 fastener and said groove being substantially perpendicular to the axis of said pivot fastener.

6. The apparatus according to Claim 2, further including a bushing adapted for use with said pivot fastener.

7. The apparatus according to Claim 6, wherein said detent includes at least one protrusion on one of said housing and said bushing and a receiving groove on the other of said housing and said bushing, said receiving groove for receiving said protrusion, said protrusion and said groove being substantially parallel to the axis of said pivot fastener.

8. The apparatus according to Claim 7, wherein said detent includes at least one resilient portion on one of said housing and said bushing, said resilient portion for accommodating said protrusion when said cam latch is moved from one of said open and said locked positions to the other of said open and said locked positions.

9. A window latch for a locking window, said window having a window frame including at least one window sash which is selectively movable between a first closed position and a second open position, said window latch comprising:

- (a) an cam latch;
- (b) a housing including a support wall; and
- (c) a pivot fastener for attaching said cam latch to said housing, wherein said cam latch is selectively movable between a first open position and a second locked position to secure said window sash in said closed position.

10. The apparatus according to Claim 9, wherein said cam latch includes an actuator arm, a locking arm and a pivot point location between said actuator arm and said locking arm.

11. The apparatus according to Claim 9, further including a finger tab on said actuator arm.

12. The apparatus according to Claim 9, said locking arm further including a cam wall.

13. The apparatus according to Claim 9, wherein the ratio of the length of
5 said actuator arm to the length of said locking arm is greater than about 2 to provide a mechanical advantage when said window latch is operated.

14. The apparatus according to Claim 9, one of said actuator arm and said
locking arm including a key lock receptor and the other of said actuator arm and said
10 locking arm including a complementary key lock extending into said key lock receptor for attaching said cam latch to said housing.

15. The apparatus according to Claim 14, further including a fastener
extending into said key lock and key lock receptor.

15
16. The apparatus according to Claim 15, said fastener is a self-tapping threaded fastener.

17. The apparatus according to Claim 14, one of said key lock and said key
20 lock receptor further including an alignment feature and the other of said key lock and said key lock receptor further including a mating alignment feature.

18. The apparatus according to Claim 9, wherein said housing extends
beyond said pivot fastener parallel to said window frame and includes an aperture for
25 receiving a fastener for attaching said housing to said window.

19. The apparatus according to Claim 18, wherein said aperture for
receiving a fastener for attaching said housing to said window includes a retainer for
receiving a fastener.

30

20. The apparatus according to Claim 18, wherein the base of said aperture for receiving a fastener includes a cavity for receiving shavings formed by attaching said window latch to said window.

5 21. The apparatus according to Claim 9, wherein said housing extends beyond said pivot fastener parallel to said window frame to include a finger shoulder for providing access to said cam latch.

22. The apparatus according to Claim 21, wherein said support wall is
10 between said aperture and cam latch.

23. The apparatus according to Claim 22, wherein said support wall is substantially perpendicular to said window frame.

15 24. The apparatus according to Claim 9, further including a locking arm catch.

25. The apparatus according to Claim 24, further including a cam detent for
engaging said locking arm.

20

26. The apparatus according to Claim 24, further including an aperture for receiving a fastener for attaching said locking arm catch to said window.

27. The apparatus according to Claim 26, wherein said aperture for
25 receiving a fastener for attaching said locking arm catch to said window includes a retainer for receiving a fastener.

28. The apparatus according to Claim 9, wherein said pivot fastener is substantially non-compressible so as to facilitate the selective movement of said cam
30 latch between said first open position and said second locked position.

29. A locking window, said window comprising:

- (a) a window frame including at least one window sash which is selectively movable between a first closed position and a second open position; and
- (b) a window latch adapted to be attached to said window and that is selectively movable between a first open position and a second locked position to secure said window sash in said closed position, said window latch comprising:
 - (i) a cam latch;
 - (ii) a housing including a support wall;
 - (iii) a pivot fastener for attaching said cam latch to said housing, wherein said cam latch is selectively movable between a first open position and a second locked position to secure said window sash in said closed position; and
 - (iv) a detent for retaining said cam latch in one of said open and said locked positions.

30. The apparatus according to Claim 29, wherein said detent provides an audible indication of said cam latch being in one of said open and said locked positions.

31. The apparatus according to Claim 29, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a receiving groove on the other of said housing and said cam latch, said protrusion and said groove being substantially parallel to the axis of said pivot fastener.

32. The apparatus according to Claim 29, wherein said detent includes at least one protrusion on one of said housing and said cam latch and a semi-circular receiving groove on the other of said housing and said cam latch, said semi-circular receiving groove including at least one barbell shaped portion for receiving said protrusion, said protrusion being substantially parallel to the axis of said pivot

fastener and said groove being substantially perpendicular to the axis of said pivot fastener.

5 33. The apparatus according to Claim 29, further including a bushing adapted for use with said pivot fastener.

10 34. The apparatus according to Claim 33, wherein said detent includes at least one protrusion on one of said housing and said bushing and a receiving groove on the other of said housing and said bushing, said receiving groove for receiving said protrusion, said protrusion and said groove being substantially parallel to the axis of said pivot fastener.

15 35. The apparatus according to Claim 34, wherein said detent includes at least one resilient portion on one of said housing and said bushing, said resilient portion for accommodating said protrusion when said cam latch is moved from one of said open and said locked positions to the other of said open and said locked positions.

20 36. The apparatus according to Claim 29, wherein said cam latch includes an actuator arm, a locking arm and a pivot point location between said actuator arm and said locking arm.

25 37. The apparatus according to Claim 29, further including a finger tab on said actuator arm.

38. The apparatus according to Claim 29, said locking arm further including a cam wall.

30 39. The apparatus according to Claim 29, wherein the ratio of the length of said actuator arm to the length of said locking arm is greater than about 2 to provide a mechanical advantage when said window latch is operated.

40. The apparatus according to Claim 29, one of said actuator arm and said locking arm including a key lock receptor and the other of said actuator arm and said locking arm including a complementary key lock extending into said key lock receptor for attaching said cam latch to said housing.

5

41. The apparatus according to Claim 40, further including a fastener extending into said key lock and key lock receptor.

42. The apparatus according to Claim 41, said fastener is a self-tapping threaded fastener.

10

43. The apparatus according to Claim 40, one of said key lock and said key lock receptor further including an alignment feature and the other of said key lock and said key lock receptor further including a mating alignment feature.

15

44. The apparatus according to Claim 29, wherein said housing extends beyond said pivot fastener parallel to said window frame and includes an aperture for receiving a fastener for attaching said housing to said window.

45. The apparatus according to Claim 44, wherein said aperture for receiving a fastener for attaching said housing to said window includes a retainer for receiving a fastener.

20

46. The apparatus according to Claim 44, wherein the base of said aperture for receiving a fastener includes a cavity for receiving shavings formed by attaching said window latch to said window.

25

47. The apparatus according to Claim 29, wherein said housing extends beyond said pivot fastener parallel to said window frame to include a finger shoulder for providing access to said cam latch.

30

48. The apparatus according to Claim 47, wherein said support wall is between said aperture and cam latch.

5 49. The apparatus according to Claim 48, wherein said support wall is substantially perpendicular to said window frame.

50. The apparatus according to Claim 29, further including a locking arm catch.

10 51. The apparatus according to Claim 50, further including a cam detent for engaging said locking arm.

52. The apparatus according to Claim 50, further including an aperture for receiving a fastener for attaching said locking arm catch to said window.

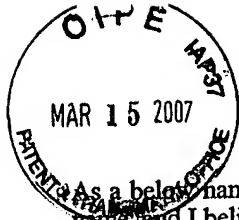
15

53. The apparatus according to Claim 52, wherein said aperture for receiving a fastener for attaching said locking arm catch to said window includes a retainer for receiving a fastener.

20 54. The apparatus according to Claim 29, wherein said pivot fastener is substantially non-compressible so as to facilitate the selective movement of said cam latch between said first open position and said second locked position.

Abstract of the Disclosure

A locking window that is selectively movable between a first closed position and a second open position and a window latch adapted to be attached to the window is disclosed. The window latch includes a cam latch, a housing including a support wall, a pivot fastener for attaching the cam latch to the housing, and a detent for retaining the cam latch in one of the open and the locked positions. The detent provides an audible indication of the cam latch being in one of the open and the locked positions. A window latch includes a locking arm catch (also known in the industry as a keeper) that includes a cam detent for engaging the locking arm when it is in the closed position. The housing extends beyond a pivot fastener parallel to the window frame. An extended portion of the housing may include a finger shoulder for providing access to the cam latch. Apertures are included in the housing and the locking arm catch for attaching to a window. Apertures may include a retainer for receiving a fastener. The support wall of the housing is between an aperture and the cam latch. Preferably, the support wall is substantially perpendicular to the window frame.



RULE 63 (37 C.F.R. 1.63)
DECLARATION FOR PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **LOCKING WINDOW HAVING A CAM LATCH** the specification of which (check applicable box(es)):

- ☒ is attached hereto.
☐ was filed on _____ as U.S. Application Serial No. _____
☐ was filed as PCT international application No. PCT/ _____ / _____ on _____ and (if applicable to U.S. or PCT application) was amended on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 C.F.R. 1.56(a). I hereby claim foreign priority benefits under 35 U.S.C. 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed or, if no priority is claimed, before the filing date of this application:

Prior Foreign Application(s): Application Number	Country	Day/Month/Year Filed
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I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application listed below:

Prior Provisional Application(s): Application Serial No.	Day/Month/Year Filed
---	----------------------

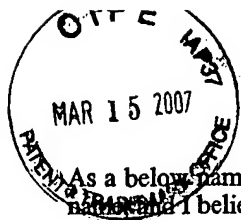
I hereby claim the benefit under 35 U.S.C. 120/365 of all prior United States and PCT international applications listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in such prior application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. 1.56(a) which occurred between the filing date of the prior applications and the national or PCT international filing date of this application:

Prior U.S./PCT Application(s): Application Serial No.	Date/Month/Year Filed	Status: patented, pending, abandoned
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1) Inventor's Signature Inventor's Name (typed)	<u>D. Keith Miller</u> D. Keith Miller First Middle Initial Family Name	Date <u>7-31-01</u>
Residence (City) Post Office Address	<u>Trinity</u> <u>7238 Trotter's Run</u> State/Foreign Country) Zip Code	<u>USA</u> <u>North Carolina</u> <u>27370</u>
2) Inventor's Signature Inventor's Name (typed)	<u>Christopher R. Rogers</u> Christopher R. Rogers First Middle Initial Family Name	Date <u>7-31-01</u>
Residence (City) Post Office Address	<u>Winston-Salem</u> <u>386 Mellon Drive</u> State/Foreign Country) Zip Code	<u>USA</u> <u>North Carolina</u> <u>27107</u>
3) Inventor's Signature Inventor's Name (typed)	<u>Farrell Smith</u> Farrell Smith First Middle Initial Family Name	Date <u>7-31-01</u>
Residence (City) Post Office Address	<u>Sophia</u> <u>4472 Craven Pines Road</u> State/Foreign Country) Zip Code	<u>USA</u> <u>North Carolina</u> <u>27350</u>

FOR ADDITIONAL INVENTORS, check box ☒ and attach sheet with same information and signature and date for each.



RULE 63 (37 C.F.R. 1.63)
DECLARATION FOR PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **LOCKING WINDOW HAVING A CAM LATCH** the specification of which (check applicable box(es)):

- ☒ is attached hereto.
☐ was filed on _____ as U.S. Application Serial No. _____
☐ was filed as PCT international application No. PCT/ _____ / _____ on _____ and (if applicable to U.S. or PCT application) was amended on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 C.F.R. 1.56(a). I hereby claim foreign priority benefits under 35 U.S.C. 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed or, if no priority is claimed, before the filing date of this application:

Prior Foreign Application(s):
Application Number _____

Country _____

Day/Month/Year Filed _____

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application listed below:

Prior Provisional Application(s):
Application Serial No. _____

Day/Month/Year Filed _____

I hereby claim the benefit under 35 U.S.C. 120/365 of all prior United States and PCT international applications listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in such prior application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. 1.56(a) which occurred between the filing date of the prior applications and the national or PCT international filing date of this application:

Prior U.S./PCT Application(s):
Application Serial No. _____

Date/Month/Year Filed _____

Status: patented,
pending, abandoned

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

- 4) Inventor's Signature _____ Date 7-31-01
Inventor's Name (typed) Jeffrey T. Hughes USA
First Middle Initial Family Name Citizenship
Residence (City) Winston-Salem State/Foreign Country) North Carolina
Post Office Address 360 Mellon Drive Zip Code 27107
- 5) Inventor's Signature _____ Date _____
Inventor's Name (typed) _____
First Middle Initial Family Name Citizenship
Residence (City) _____ State/Foreign Country) _____
Post Office Address _____ Zip Code _____
- 6) Inventor's Signature _____ Date _____
Inventor's Name (typed) _____
First Middle Initial Family Name Citizenship
Residence (City) _____ State/Foreign Country) _____
Post Office Address _____ Zip Code _____

FOR ADDITIONAL INVENTORS, check box ☐ and attach sheet with same information and signature and date for each.

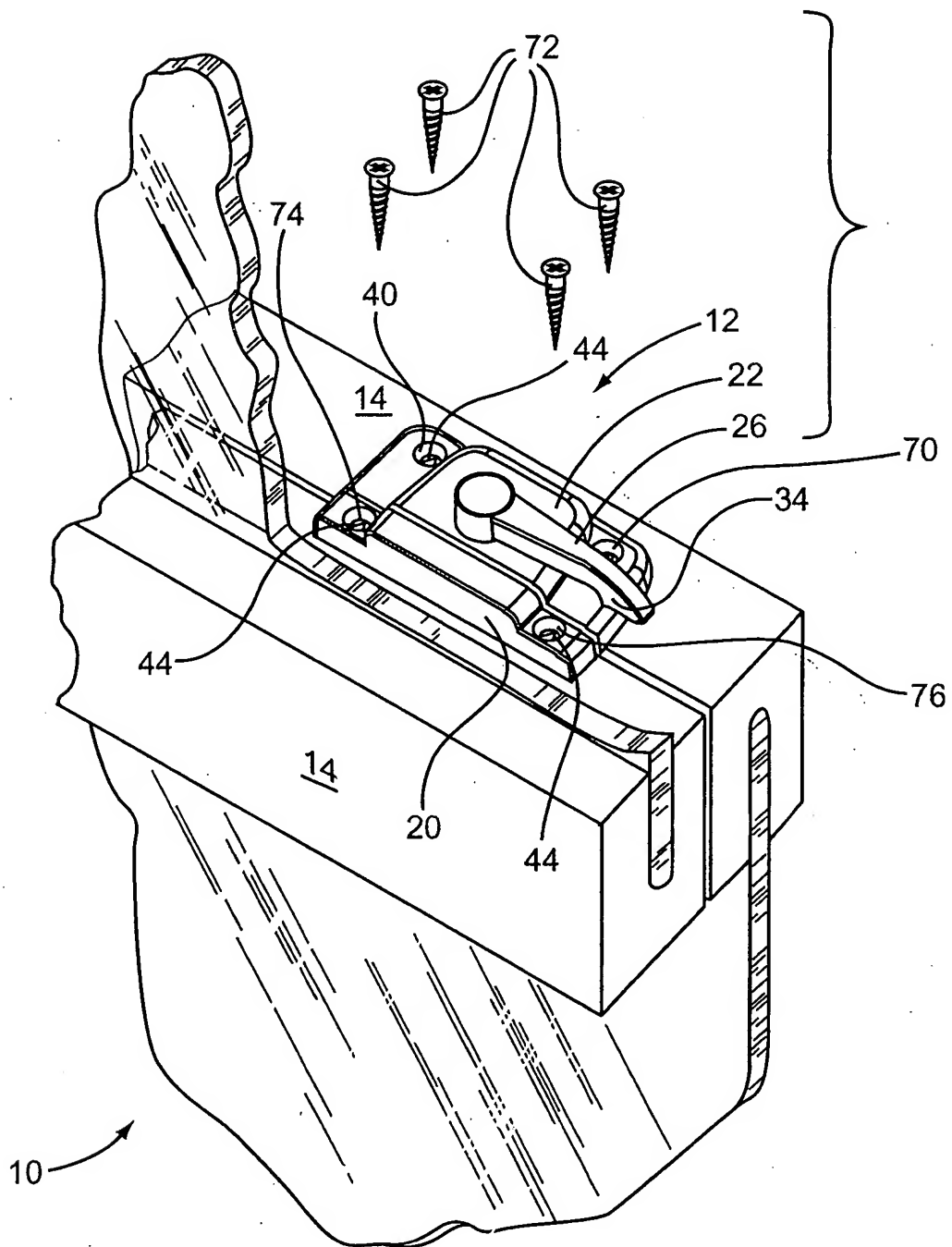
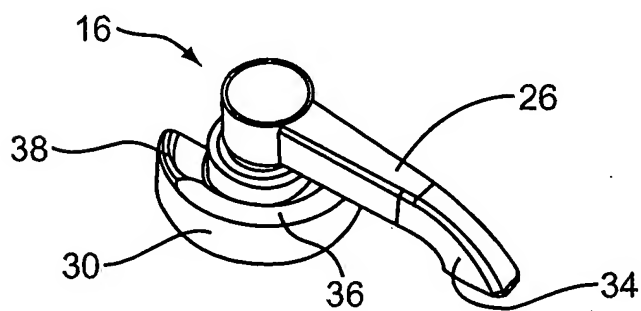
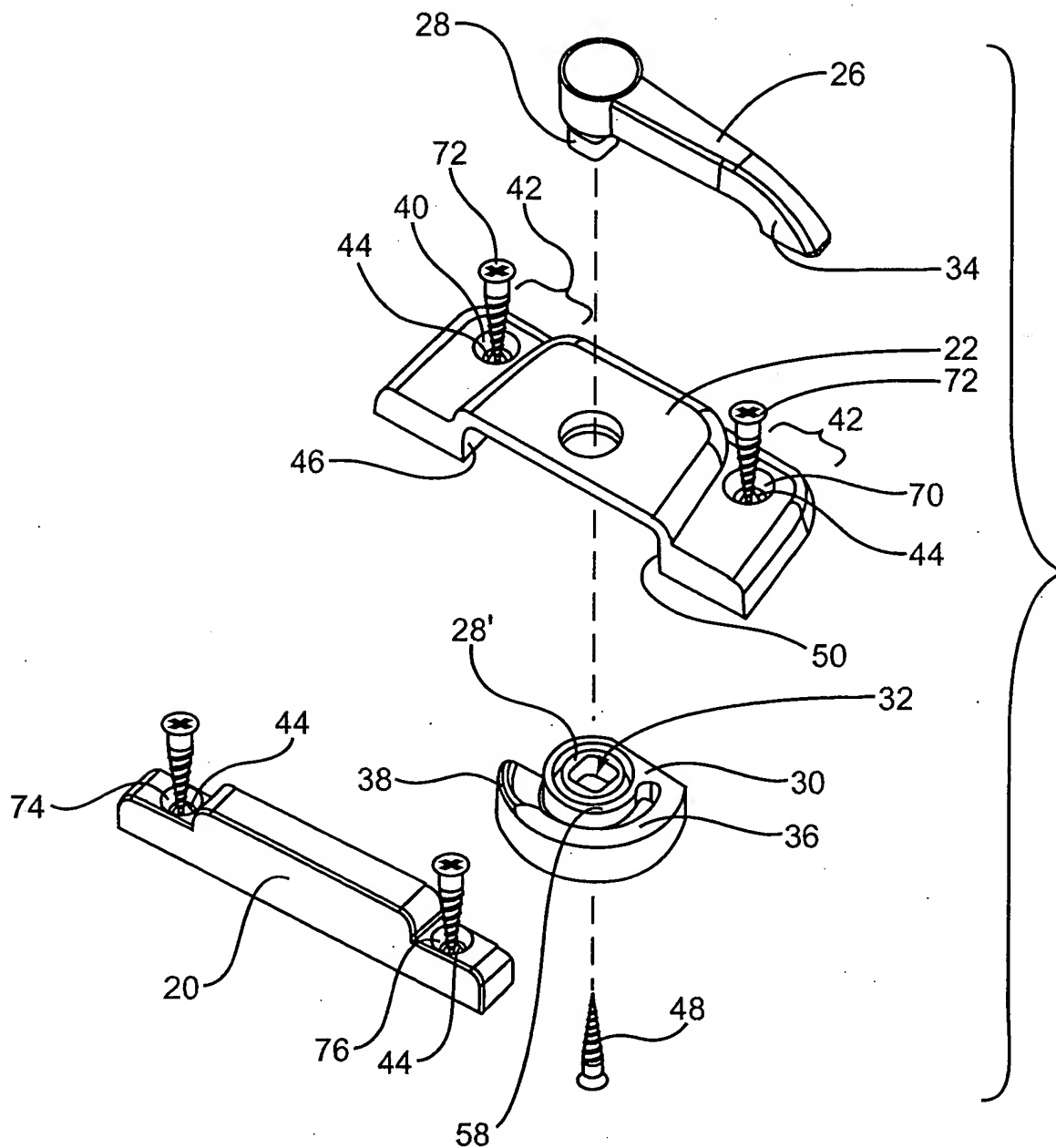


FIG. 1



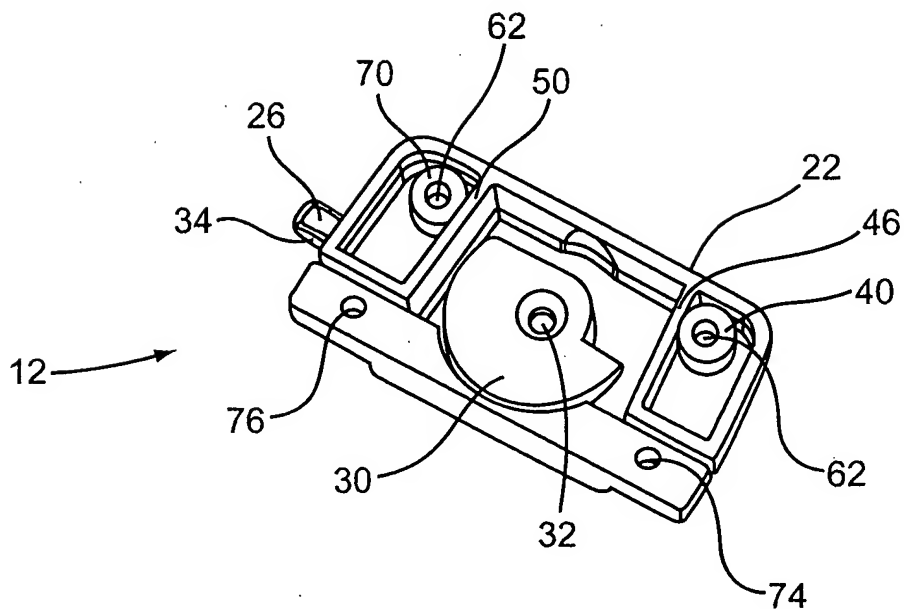


FIG. 3A

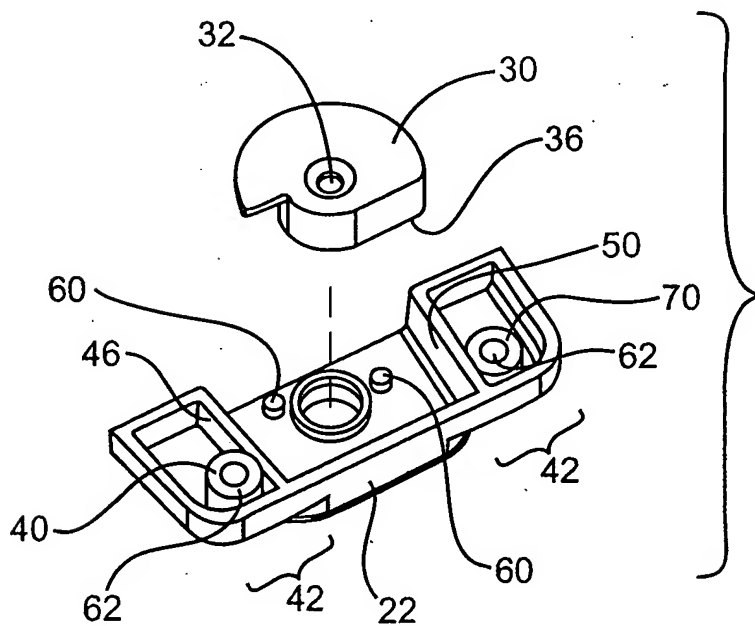


FIG. 3B

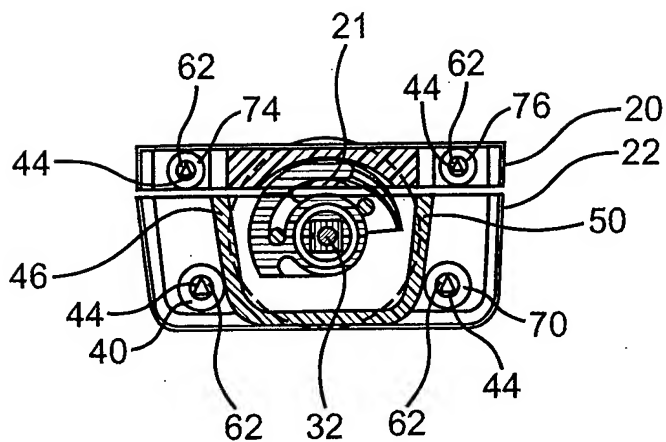


FIG. 4A

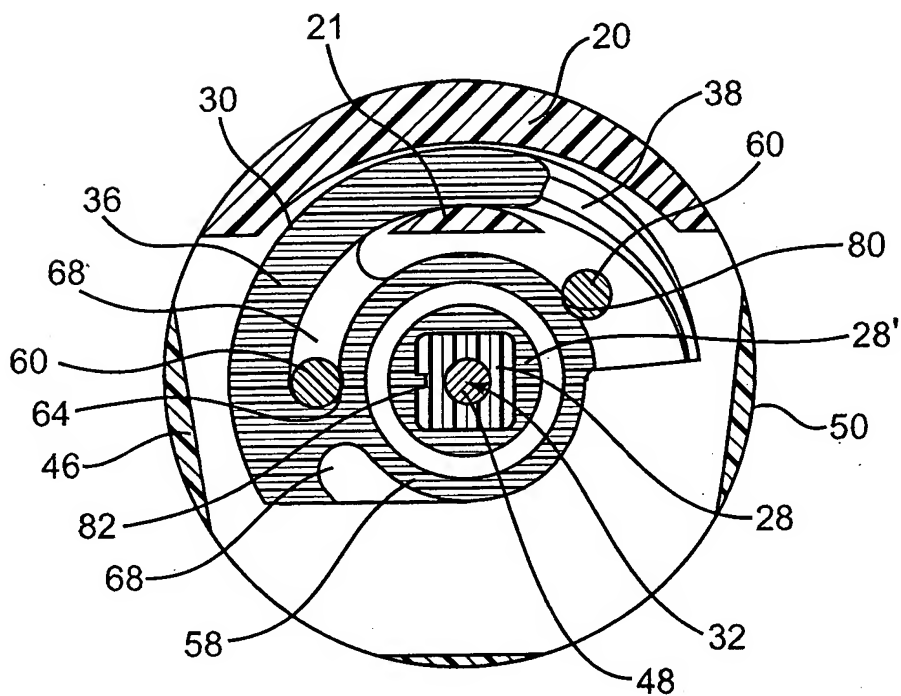


FIG. 4B

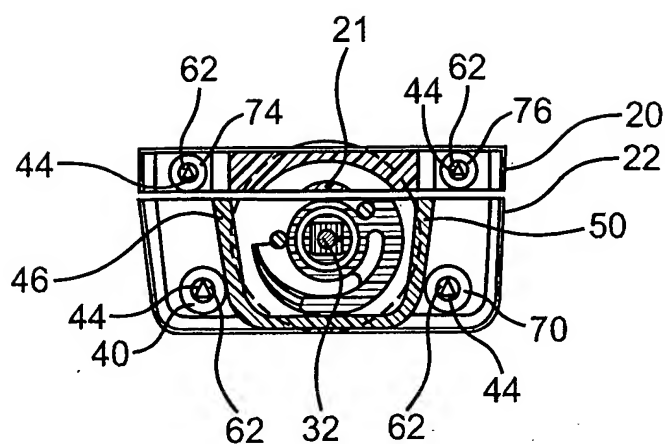


FIG. 5A

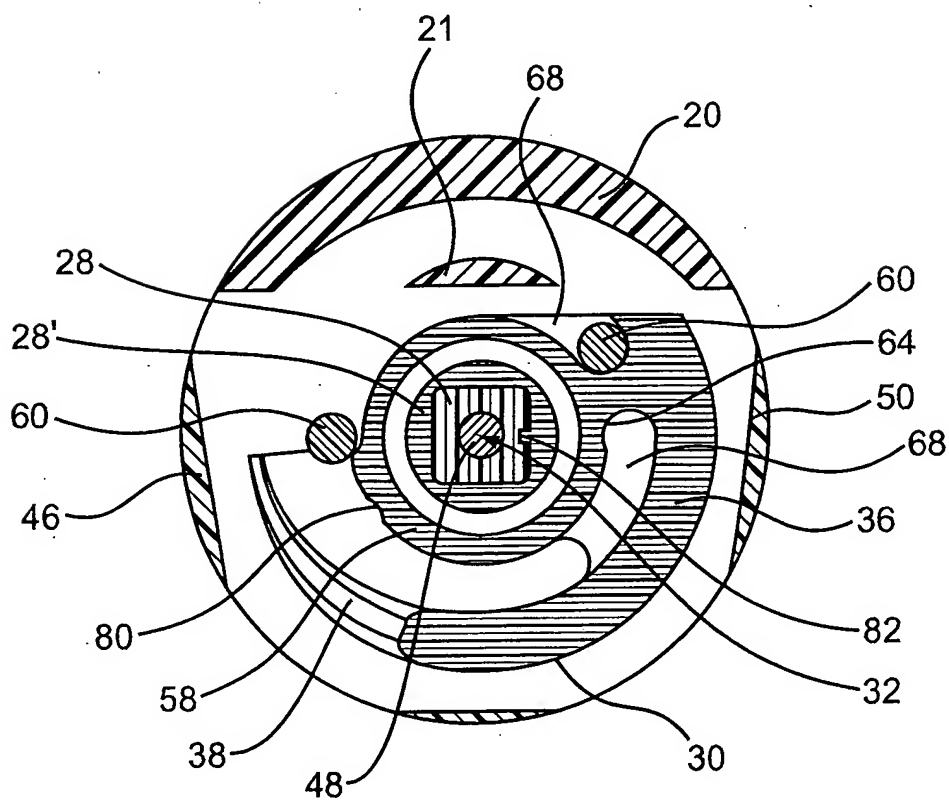


FIG. 5B

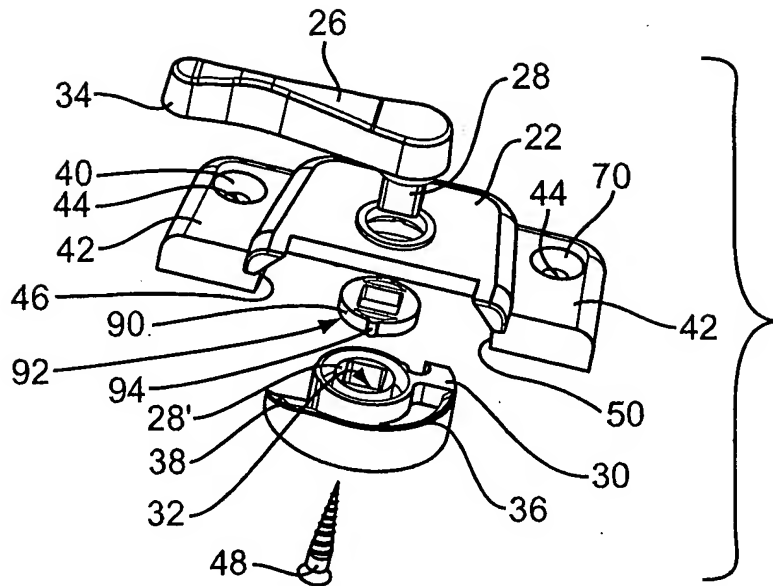


FIG. 6A

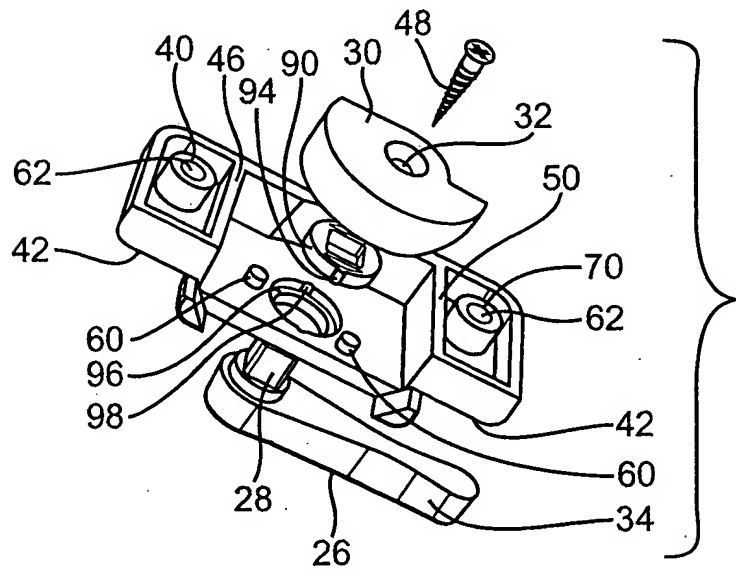


FIG. 6B

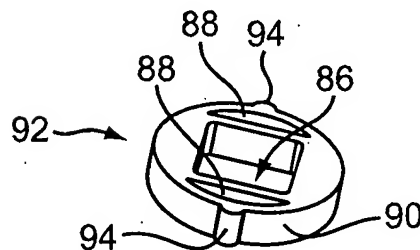


FIG. 6C

10. Related Proceedings Appendix

None.